Mai Elkady

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Interests

Generative Models, Normalizing Flows, Machine Learning, Deep Learning, Data Science, Big data, Computational Biology

Education

Aug 2018 – Present
Ph.D. in Computer Science, *Purdue University*, West Lafayette, IN, USA.
○ GPA: 3.8
○ Advisor: Petros Drineas, David Inouye
○ Honors: The Purdue University Teaching Academy Graduate Teaching Award for Spring 2020

Aug 2016 – May 2018
M.Sc. in Computer Science, *Purdue University*, West Lafayette, IN, USA.
○ GPA: 3.8
○ Honors: Fulbright Scholarship

Sep 2007 – June 2012
B.Sc. in Communication Systems, *Ain Shams University*, Cairo, Egypt.
○ GPA: 3.58
○ Honors: Dean's list for Fall 2007 and Spring 2008

Skills

Programming Languages
Python, C/C++, MATLAB, R, SQL, PHP

Languages
Fluent in English and Arabic (mother tongue), Basic knowledge in German (A1)

Publications

Workshops
Mai Elkady*, Jim Lim*, David I. Inouye,"Discrete Tree Flows via Tree-Structured Permutations", ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (INNF+), July 2021

Conferences
Mai Elkady*, Jim Lim*, David I. Inouye,"Discrete Tree Flows via Tree-Structured Permutations", ICML, July 2022

Sabine Brunswicker*, **Mai Elkady***, Feny Patel*, "Submissions to a COVID-19 Data Science Challenge: the role of skills and platform engagement", ACM Collective Intelligence Conference, June 2021

Journals
Aritra Bose, Vassilis Kalantzis, Eugenia-Maria Kontopoulou, **Mai Elkady**, Peristera Paschou, Petros Drineas,"TeraPCA: A fast and scalable software package to study genetic variation in tera-scale genotypes", Bioinformatics

Experience

Aug 2018 – Present
Teaching Assistant, *Computer Science Department*, Purdue University.
for C Programming (CS 159) - Spring 2022, Fall 2022
- Held office hours to assist students with coding problems
- Monitored online platforms to resolve student's questions and concerns
- Developed assignments to test the student's understanding

for Programming in C (CS 240) - Fall 2018, Fall 2019, Spring 2020
- Held labs and office hours to assist students with coding problems
- Graded quizzes, and exams
- Developed assignments to test the student's understanding

for Foundations of Computer Science (CS 182) - Spring 2019, Spring 2021
- Held office hours to assist students with problems
- Held sections to show problem solving demonstrations
- Graded Homeworks

May 2022 – Aug 2022
Data Scientist Intern, *Microsoft Search, Assistant, and Intelligence (MSAI)*, Microsoft.
- Worked on testing different models for enhancing the results of topic conflation which is an Natural Language Processing (NLP) task concerned with detecting the similarity between extracted pairs of topics in terms of semantics
- Worked on creating pipelines on Azure Machine Learning for training and testing different models
- Added a multitask setting for training an existing BERT based model

June 2021 – Dec 2021
Content Developer, *Computer Science Department*, Purdue University.
- Developed new homework content for CS 159:C Programming
- Tested and deployed the homework's code on the vocareum platform

June 2021 – July 2021
Research Mentor, Summer STEM Institute (SSI).
- Worked closely with three high school students to help them design and conduct their own data science research projects.
- Hosted office hours for students in the bootcamp and research program.

Nov 2020 - April 2021
Fellow, *Research Center for Open Digital Innovation (RCDOI)*, Purdue University.
- Worked preparing data for IronHacks COVID-19 August 2020 Hackathon.
- Worked on analyzing topics for participants notebooks, by running LDA for topic modelling.
- Analyzed participants data to gather interesting observations, and determine the important factor predicting a participant to submit.

May 2020 – Dec 2020
Research Assistant, *Computer Science Department*, Purdue University.
- Worked on data size reduction by selecting the most informative rows and sketching the columns for the purpose of being used later in logisitc regression.
- Wrote code in Python and MATLAB to implement and examine potential methods of solving this problem.

Feb 2013 – July 2016
Junior Lab Engineer, *Electronics Department*, The American University in Cairo (AUC).
- Operated and maintained electronic equipment (servers, computers, printers, sophisticated measurement equipment, kits and development board) in the Electronics and Communications Engineering laboratories and offices.
- Assisted students with technical problems in labs and with courses' projects including senior projects.

Dec 2015 – Jan 2016
System Administrator & Developer for Arches, *Theban Mapping Project (TMP)*, AUC.
- Worked on creating a web based database of Egyptian archaeological sites using an open source software product called 'Arches' which has been particularly developed for inventories of cultural heritage.
- Customized Arches for the Egyptian database by writing code in Python, JavaScript, HTML, and CSS

Projects

Aug 2020 – Sep 2020
IronHacks COVID-19 Data Science Challenge, *Purdue University*.
Participated and won third place in the Ironhacks COVID-19 Data Science Challenge where the task was to predict the weekly foot traffic at merchants in Indiana in order to understand the COVID-19 impact and risk. To solve this problem I used **Python** to train a ridge regression model that was able to obtain good results in predicting the foot traffic at various stores in Indiana.

Dec 2018 – Jan 2019
Flower Species Identification, *PyTorch Scholarship Challenge Program, Udacity*.
Employed a DenseNet pre-trained Convolutional Neural Network model to train an image classifier to identify 102 different species of flowers. The code was written in **Python** and used **PyTorch** for deep learning, and the training was done utilizing GPUs on Google Colab. The project was then deployed as a webapp using Flask on herokuapp.

May 2017 – Aug 2017
Synthetic Genotype Data Simulator, *Purdue University*.
As part of a team, implemented a data simulator in **C/C++** that generates synthetic genotype data using the Pritchard-Stephens-Donnelly (PSD) model.

Oct 2016 – Nov 2016
Data Mining Project: Predicting Pulp Fiction Lovers, *Purdue University*.
As part of a class Kaggle competition, tried several Machine learning approaches, and coded them in **R** and **Python**, to predict whether users will like the movie Pulp Fiction given their previous movie ratings.

Sep 2011 – June 2012
Seniors Graduation Project, *Ain Shams University*.
○ Wrote **Bash scripts** to parse log files of calls in Vodafone network, and stored the output of the parsing in a **MySQL** database.
○ Built a website in **PHP** that graphically represents data stored in the database.

Posters

July 2021
"Discrete Tree Flows via Tree-Structured Permutations", ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (INNF+)

June 2019
"TeraPCA: A Fast and scalable method to study genetic variation in tera-scale genotypes", American Society of Human Genetics (ASHG), Orlando, FL, October 2017 (presented by A. Bose)/ Gene Goloub SIAM Summer School, Aussois, France, June 2019 (presented by **M.Elkady**)

Attended Conferences and Summer Schools

June 2019
Gene Goloub SIAM Summer School (G2S3), *Aussois, France*.
Selected as one of the 40 participants to attend the 9th G2S3 on high performance data analytics

Sep 2018
Grace Hopper Conference (GHC), *Houston, Texas*.
Awarded a scholarship by Purdue Computer Science department to attend GHC 2018

Activities

Jan 2017 – Aug 2019
Outreach officer, *Purdue Fulbright Association (PFA)*, West Lafayette, IN, USA.
○ Organized events and activities for PFA members.

Jan 2016 – July 2016
Volunteer, *Safarni*, Cairo, Egypt.
○ Designed decorations for safarni travel days.
○ Directed and supervised kids during the safarni travel days.

Sep 2012 – Oct 2012
Exchange Participant, *International Kindergarten Project*, Lublin, Poland.
○ Taught children aged from 4 - 12 years about Egypt and its culture.
○ Prepared weekly activities plan for each day (with games, dances, songs and/or presentations) to engage the children in learning.